

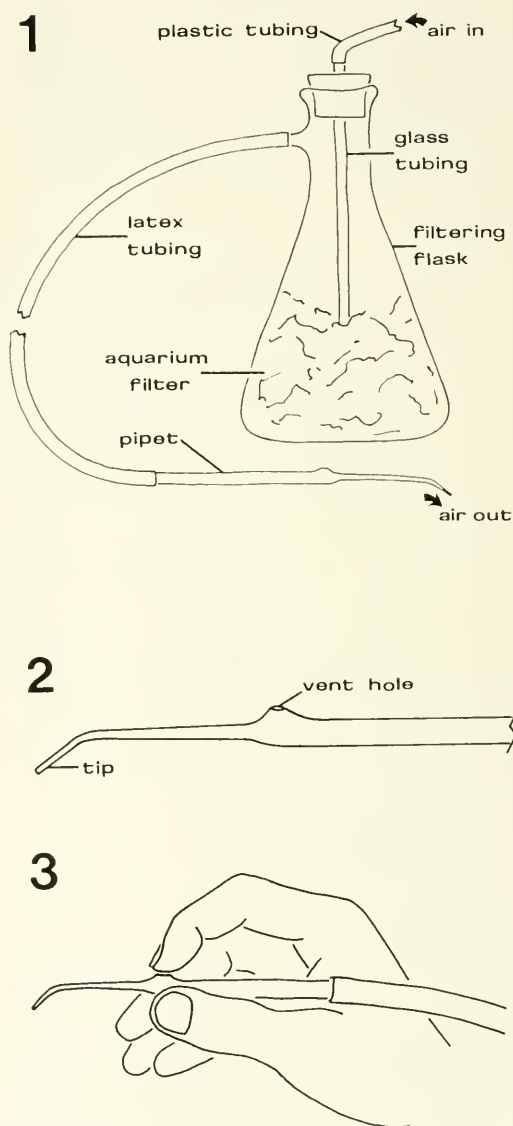
NOTE

A Simple Device to Clean Insect Specimens for Museums and Scanning Electron Microscopy

Insect specimens are often contaminated with debris that obscures structures of interest. Scales and hairs adhere to specimens taken from malaise traps or by other collecting methods that capture Lepidoptera with other insects. Dust accumulates on insects both in life and as mounted specimens in collections. When mounting insects for scanning electron microscopy, fragments of dissected structures often adhere to the specimen. Below I described a simple, inexpensive device that uses a fine jet of air to efficiently remove loose debris without damaging specimens.

The device (Fig. 1) consists of a one liter filtering flask, a one-hole rubber stopper (no. 8), latex rubber tubing (6.4 mm I.D., ca. 80 cm long), plastic tubing (6.4 mm I.D., ca. 70 cm long), glass tubing (8 mm O.D., ca. 28 cm long), a small quantity of polyester aquarium filter fiber, and a modified disposable glass Pasteur pipet (14.6 cm long). Latex tubing facilitates manipulation of the pipet; plastic tubing is less likely to collapse and block air flow to the device. The polyester aquarium filter fiber removes moisture and other contaminants from the air supply.

The pipet (Fig. 2) is modified as follows: Reduce the diameter of the hole in the tip of the pipet to about 0.25–0.5 mm by passing it through the flame of a Bunsen or Fisher burner. For safety, use protective eye wear, and before making the vent hole attach a length of tubing to the pipet to keep your face away from the flame. Make the vent hole by holding one side of the shoulder of the pipet in the flame. When the glass begins to glow, blow through the tubing attached to the pipet until a bubble begins to swell from the area being heated. Continue blowing until the bubble bursts, thus forming the vent hole. Polish the edge of the vent hole



Figs. 1–3. Device for cleaning insect specimens. 1, Complete device. 2, Modified pipet. 3, Holding the pipet.

by passing it through the flame. The final diameter of the vent hole should be about 3–4 mm. Finally, bend the pipet near the tip by passing it through the flame. A low flame works well for modifying the tip of the pipet; a hotter flame is best for making the vent hole.

Assemble the device as shown in Fig. 1 and attach the plastic hose to a source of compressed air. In many laboratories compressed air is available from stopcocks built into the benches.

Air passing through the tip of the pipet is used to clean specimens. Use *very* low volumes of air from the compressed air source. The optimal volume depends on the diameter of the hole in the tip of the pipet. The air passing out of the vent hole should be barely detectable for pipets with tips reduced to 0.25–0.5 mm.

Air is forced through the tip of the pipet by covering the vent hole with your index finger (Fig. 3). Because the hole in the tip is much smaller than the vent hole, air pressure increases in the flask when the vent hole is covered. Simultaneously, the velocity of the air leaving the tip of the pipet increases. When cleaning specimens, use short bursts of air by opening and closing the vent hole at regular intervals, or by only partially covering the vent hole. This will prevent the stopper from being blown out of the flask and will also keep the velocity of the jet from

becoming great enough to damage specimens. Loose debris is blown off of a specimen by directing the jet toward the area to be cleaned. This can be done under a dissecting microscope. Debris that is glued to a specimen by oil or other such substances usually cannot be removed.

Because of the low volume of air used, it is unlikely that pressure within the flask will become great enough to break the flask. Moreover, the stopper, if not placed in the flask with excessive force, acts as a safety valve. However, as an added precaution the flask should be wrapped with nylon-reinforced tape.

Additionally, by reversing the direction of air flow through the device, it can be used to pick up and manipulate small delicate objects. For this purpose, install the device onto a vacuum line.

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